Performance of "Look-Ahead" Linear Multistep Methods

Taketomo Mitsui (Doshisha University), Dauda Gulibur Yakubu

We are concerned with numerical solutions of the initial-value problem of ordinary differential equations (ODEs):

$$\frac{dy}{dx} = f(x, y) \quad (a \leq x \leq b), \quad y(a) = y_I.$$

We recently proposed "look-ahead" linear multistep methods (LALMM) as a new class of discrete variable solution of the problem. An LALMM scheme involves the "look-ahead" approximation together with the look-for one and corrects the look-for approximation by a predictor-corrector pair. Our anticipation is a good performance of LALMM from both viewpoints of accuracy and stability. We will discuss its actual performance mainly based on "look-ahead" linear two-step schemes.